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Division of Capital Asset Management

D·C·A·M

Building for the Commonwealth

Office of Facilities Maintenance

What you need to think about when maintaining your facilities!

This guidance document is intended to assist facilities maintenance and operations staff in performing their duties. Facilities staff are advised that this document does not constitute legal advice nor does it relieve facilities operators and maintainers of meeting their obligations and responsibilities in performing their job duties. The documents and other references cited in this document reflect information available at the time of its publication; however, it is the responsibility of facilities personnel to ensure that they meet the current and relevant technical, legal and regulatory requirements associated with operating and maintaining facilities.

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Introduction

As part of ongoing discussions among the program managers at DCAM's Office of Facilities Maintenance (OFM), we found that many of the staff who are taking care of state facilities do not necessarily have facility maintenance backgrounds and are often working with little guidance or technical support. During one of our many discussions, we decided that a "beginners" manual for facility maintenance could benefit all of those people who maintain state buildings. It is impossible to know how to do everything that is necessary to prevent future infrastructure problems in a facility. Technology and standards are in a constant state of change, and no one person has the time to just sit at a desk and keep up with those changes. By introducing some of the issues involved with complete facility maintenance, we hope that this booklet serves as a helpful, informative resource.

If you need more information, you now have assigned program managers to support you. If we don't have the information you need, we will find it and share it! It is our job to make sure that you know that you aren't out there alone – our job is not to report you, but to support you!

Background

The Office of Facilities Maintenance (OFM) provides guidance and support to DCAM, state agencies and the Administration on the preservation of capital assets through the development of comprehensive and cost-effective maintenance and management strategies. Specifically, the office is responsible for:

- Ensuring the maintainability of new construction projects through incorporating a rigorous analysis of the operations and maintenance aspects of capital projects
- Providing tools that facilitate good maintenance practice such as CAMIS
- Developing energy conservation projects that lower operations costs.
- Establishing a network of state facilities managers to facilitate communication and sharing of information on maintenance matters. (MAFMA)
- Working collaboratively with Client Agencies to develop standards, guidelines and benchmarks for facilities maintenance and management activities
- Recommending appropriate operating funding to optimize DCAM's capital investment in state buildings

Mark Nelson is the Deputy Commissioner of OFM, Hope Davis is the Director and interim manager of the Energy Team, Alana Swiec is the office manager, Mel Klayman handles information and knowledge management, An-Ping Chi is the CAMIS project manager and the program managers and their areas of coverage are as follows:

OFM Program Managers

Scott Calisti	Higher Education	617-727-4050 ext. 267	**scott.calisti@state.ma.us**
Susan Kreusch	Environmental/Other	617-727-4050 ext. 262	**susan.kreusch@state.ma.us**
	Public Safety	617-727-4050 ext. 262	
Ed Nicosia	Human Services	617-727-4050 ext. 265	**edward.nicosia@state.ma.us**
Tom Tagan	Courts	617-727-4050 ext. 272	**francis.tagan@state.ma.us**

MAFMA

OFM has established a network of state facilities managers, the Massachusetts Facilities Managers Association (MAFMA) that meets periodically to discuss specific topics of interest. OFM is using the MAFMA network to disseminate information on training opportunities and new technologies, as well as to inform facilities personnel of proposed regulatory or statutory changes that may affect facilities operations. In addition, MAFMA members have established working committees to address issues of interest to facilities operators and managers. Committees include:

Scott Calisti - Commissioning and Grants
Susan Kreusch - Compliance, Correctional sub-committee, and HR/Personnel
Edward Nicosia - Contracts
Tom Tagan - Standards and Education
An-Ping Chi – CAMIS

State facilities personnel who are interested in participating in this informal association should e-mail the chair directly or contact Alana.Swiec@state.MA.US.

We are have developed a MAFMA web site which will allow quick and easy access to all sorts of vuable links, manuals and information. This can be reached by the following link: http://www.mass.gov/cam/MAFMA/about_MAFMA.html

If you have not already signed up to be included on the MAFMA list serve please contact Tom Tagan at francis.tagan@state.ma.us to be included.

CAMIS Project History and Status

In 1999 the Massachusetts legislature appropriated funds to conduct a comprehensive condition survey of the state's capital assets and to procure a software package to manage the collected data and assist facilities in their daily maintenance activities. As a result, DCAM has implemented the comprehensive Capital Asset Management Information System (CAMIS) program, including the CAMIS survey and the CAMIS software. Contracts for the survey and software were awarded to Parsons Brinckerhoff (PB) and FAMIS Software, Inc. (FAMIS), respectively. Parsons Brinckerhoff, through its approved subcontractors, completed facility condition assessment surveys of over 5,000 buildings comprising over 73 million square feet of space. The data from the surveys is used to inform and support capital planning and budgeting decision-making. Preventive maintenance schedules and cost estimates for addressing the deficiencies identified through the surveys have been transferred to the CAMIS software package that DCAM purchased for all state facilities to utilize. CAMIS is a database inventory of state facility infrastructure – elevators, HVAC and its major related components. Additionally, facility staff can add items such as fire extinguishers (by location) or tasks (i.e. cleaning windows, cleaning carpets, etc.)

If you are unfamiliar with the CAMIS database or need help utilizing CAMIS, please contact your assigned Program Manager in the DCAM Office of Facilities Maintenance or An Chi, CAMIS manager. The program

managers listed are your DCAM – OFM representatives and are available to help you with all of your facility maintenance needs.

Facilities Management

Facilities management as defined by the Facilities Engineering and Management Handbook[1] "is a term of broad application used by those who, with proper preparation and training, are occupied with solving the problems of a wide range of disciplines." Considering this definition, it would be almost impossible for one person to have all the knowledge necessary to maintain his/her building(s). Additionally, the constant changes in the technologies associated with a building's infrastructure make it difficult to keep all services inhouse, making one of the jobs of a facility manager that of a contract manager as well.

Reactive maintenance or, fixing or replacing equipment only when it breaks is extremely costly and the least effective strategy to maintain a building. Additionally, the equipment failure can create safety hazards, costly downtime while waiting for parts, and increased costs due to the associated disruptions. If parts are hard to find, out of service times can be greatly increased.

Preventive maintenance requires scheduled maintenance at specific time frames and avoids many of the problems associated with reactive maintenance. It is proactive and can reduce downtime costs, eliminate recurring problems, extend the useful life of a piece of equipment or a building and save energy. CAMIS is a useful tool for this process since it builds in the scheduling of preventive maintenance.

As part of our continuing effort to support preventive maintenance for all of the Commonwealth's assets, DCAM/OFM developed this beginners guidebook of facility maintenance to help those maintenance employees who may have taken on maintenance responsibilites by default and without a formal facility maintenance background. Our goal is to help you run your facilities in the best way possible by maximizing your maintenance practices.

Maintenance Topics

The following pages list and describe a very basic outline of some of the issues that will arise during facility maintenance. Where the topic is a specific system or equipment, we note recommended frequency of work. Where the subject is a more general item, we cite useful, relevant information sources. It is not the only guidebook you should use to perform your duties, but it should help you become aware of those areas within your facility that need regular maintenance. We highly recommend that your first source for preventive maintenance be your CAMIS data base which includes the manufacturer's recommendations for preventive maintenance for your specific equipment, or the manufacturer's O&M manual. If the manual is unavailable, you can often find the necessary information on the manufacturer's web sites, or you can check the associations and additional resources area at the end of this manual. Please remember that OFM's program managers are always available to help you with your facility maintenance questions!

[1] McGraw-Hill, 2001, ISBN 0-07-059323-X

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Additionally, OFM has a library of various books available that might have the information you need. If you need suggestions for forms, checklists or procedures for any of your assets, please contact your program manager who will make copies of that information available to you.

Although the topics have recommended maintenance timetables, if your facility is subject to any type of certification process, the requirement for certification may increase maintenance practices. Please check with the certifying association for their specific requirements for your facility.

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Maintenance Topics

A= Annually, B=Bi-Annually, M=Monthly, W=Weekly, Q=Quarterly, D=Daily, N=As necessary

Air Conditioner (A,B)

The following air conditioning maintenance tasks should be accomplished in early Spring: check and change air filter (change/clean bi-monthly), clean condenser coil if needed, lubricate fan motors and bearings, check fan blade for cracks and balance, check pressures and temperatures (discharge temperature as well), amperage and voltages, check electric contacts for loose wiring connections and burnt contacts, check condensate drain pan and line for proper drainage, clean evaporator coil if needed.

Window units should be maintained according to manufacturer recommendations. Filters should be checked frequently when in use and cleaned/replaced when dirty. Condensation should drain outdoors. They should be installed in an airtight manner to prevent infiltration by water, drafts or pests.

Air Handling Units (B)

Should be equipped with properly draining drip pans that are free of debris and scale. Drip pans should be insulated underneath to prevent condensation accumulation. All insulation in contact with conditioned air should be intact. Chilled water pipe insulation should be free of microbial growth.

American With Disabilities Act (ADA)

MA Office on Disabilities
http://www.mass.gov/mod/default.html

MA Architectural Access Board
http://www.mass.gov/aab/

ADA Accessibility Guidelines for Buildings and Facilities (ADAAG)
http://www.access-board.gov/adaag/html/adaag.htm

ADA Hot Links and Document Center
http://www.jan.wvu.edu/links/adalinks.htm

U.S. Department of Justice**,** Americans with Disabilities Act, ADA Home Page
http://www.usdoj.gov/crt/ada/adahom1.htm

Asbestos Management (A)

The presence of asbestos in a facility does not necessarily require its immediate removal; however, it must be maintained in a proper manner. Annual asbestos awareness training should be given to all maintenance and custodial staff who work in buildings that contain asbestos (This can often be done by video tape, with permanent records kept in a file.) Visual inspections should be performed periodically to see if the condition has changed. Permanent records should be kept with response actions taken for friable and nonfriable asbestos-containing building material, as well as who performed the action. Professionals should be hired to deal with construction, renovation or repair work that may cause a disturbance or removal of asbestos insulation, sealing or flooring materials, or any other suspected materials containing asbestos. Vinyl asbestos flooring should never be sanded, and floor stripping must be done wet using low abrasion pads at speeds below 300 rpm. According to OSHA it is assumed that the following materials contain asbestos: thermal system insulation, surfacing materials and vinyl asphalt flooring materials, other acoustic insulators, thermal insulation, fire proofing, other building materials installed prior to 1981 contain asbestos unless proven otherwise. A baseline asbestos survey of all buildings should be conducted if the facilities' buildings were built before 1988.

Check the MAFMA web site for a generic Asbestos O&M manual that you can use as a format for your facility.

Asbestos Hazard Emergency Response Act (AHERA)

MA Department of Environmental Protection
Asbestos Information & Resource Guide
http://www.mass.gov/dep/air/asbguid.htm

The Division of Occupational Safety's (DOS's) Asbestos Program
http://www.mass.gov/dos/asbestos/index.htm

OSHA Asbestos Advisor
http://www.osha.gov/dts/osta/oshasoft/asbestos/index.html

Attics (Q)

Attics are often used for storage, but should not obstruct your ability to check for roof leaks. Water damage can create problems with mold, so inspections should be done after heavy rains. Attics should also be checked seasonally for animal or insect nests, waste or debris. If there is evidence of animal infestation, entryways need to be located and blocked; traps need to be set and nesting material removed. If pigeon guano is present, it will need to be properly removed.

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-402.htm

Auditoriums (A, N)

All risers, platforms and guardrails should be inspected annually for safety. All curtains must be fireproofed annually. Curtains do not need to be dry cleaned very often but will extending the lifetime of the curtain. If you are unsure of the fabric content, you may need to have it tested for asbestos. Periodic maintenance should include vacuuming and dusting the curtains. Inspections should be done by a professional if you don't have the equipment or manpower to do it yourself.

Backflow Prevention (A)

Should be tested annually. Contact your local water provider for more information. See Cross Connection Control.

Bloodborne Pathogens

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV). You do not have to be a medical facility to be exposed to cleaning situations which might include blood. Cuts and nosebleeds happen anywhere, so when these types of cleaning situations arise, it is best to be prepared. The Commonwealth of Massachusetts Division of Occupational Safety has a certified occupational health nurse (617-969-7177) who can assist in training and developing policies, and has a PowerPoint training program available upon request.

Commonwealth of Massachusetts Division of Occupational Safety
Model Policy for School Facilities
http://www.mass.gov/dos/iaqdocs/pdf_410_ecp_schools.pdf

U.S. Department of Labor Occupational Safety & Health Administration
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

OSHA Compliance
http://www.freeoshainfo.com/pubpages/bbp.htm

Boilers (Steam, Hotwater) (A)

Annual water treatment is necessary to remove impurities that cause scale and deposits which lower boiler efficiency. By reducing oxygen, water treatment also prevents condensate piping corrosion and iron fouling of boiler tubes. Boilers should be inspected and maintained annually prior to the heating season. Maintenance should include: exchangers(water treatment), draft fans (lubrication and belt inspection/adjustment), air vents (inspect for proper function to prevent water hammer in hot water systems), pump lubrication (feedwater and condensate) steam traps (inspect temperature across trap to ensure steam separation from condensate line), check the chimney base for dirt or obstructions, check motors, bearings and couplers, lubricating as required. Do not over lubricate. To increase efficiency, run at full capacity, reduce excess air, clean heat transfer surfaces, upgrade insulation, and insulate steam lines. Boilers may be confined space. If entering boilers for cleaning you must be knowledgeable on confined space entry procedures.

Break Rooms (B)

All food should be stored in sealed containers, and refrigerators should be emptied regularly. Trash should be emptied at the end of the day. Vending machines should be maintained by the vendor and kept clean. Soda and snack vending machines should be cleaned a minimum of twice a year by the vendor to remove sticky surfaces and crumbs.

Building Envelopes (A)

Walls should be inspected for cracks and separations, exposure damage and pest infestations. Weep holes should be cleared of obstructions. General cleaning should be done regularly and is particularly important if the facility is located in an area where environmental conditions (fumes from a highway, high levels of dirt, conditions conducive to mildew, algae or other pollutants) soil the building. The best and safest way to clean a building exterior is a liquid spray used at the lowest pressure possible (below 600 psi) to remove surface soils without damaging certain finishes. Anything over 600 psi could seriously impair the integrity of the finish. Sealant should be replaced around windows and other openings as soon as aging (cracking or drying out) is noticed or during an annual inspection. While doing your annual inspection it is also important to check for cracks, holes or penetration of the finish. Any compromise should be repaired as soon as possible. Any bulges, wrinkles, framing problems, structural deterioration, or evidence of damage due to condensation should be repaired.

Burners

See Boilers.

CAMIS

For more information on CAMIS, please contact your program manager or, the CAMIS Program Manager.

DCAM Office of Facility Maintenance/CAMIS
http://www.mass.gov/cam/statewide/sw-camisUser.html

Carbon Monoxide Detectors (A, Q)

Since carbon monoxide is not easily noticeable, it is important that staff be trained to recognize the signs and symptoms of carbon monoxide poisoning including: headache, dizziness, irritability, confusion/memory loss, disorientation, nausea and vomiting, abnormal reflexes, difficulty in coordinating, difficulty in breathing, chest pain, convulsions/seizures, coma.

New Carbon Monoxide Regualtions went into affect in February, 2006; see the link below.

. All combustion appliances that are potential sources of carbon monoxide should be inspected on an annual basis (stoves, furnaces, hot water heaters, etc). Make sure all venting is clear of obstruction especially during the snow.

MA Department of Fire Services
http://www.mass.gov/dfs/osfm/pubed/flyers/carbon_monoxide_ff.pdf

http://www.mass.gov/dfs/index.shtm
New Regulations (2006)
http://www.mass.gov/dfs/osfm/fireprevention/cmr/527031.pdf

Carpets (A)

Carpets should not be installed in areas where there is plumbing since there is a likelihood they will get wet or in areas where there is a large volume of food usage. Whole carpet cleaning should be done annually (DCAM recommends twice a year) by a professional if you don't have the equipment or manpower to do it yourself. Chemicals used should not leave any noticeable odor. If cleaning is done when there is high humidity a microbial should be added to deter mold. Spot cleaning should be done when necessary to keep staining to a minimum. Tears, bubbles, loose edges, holes and other tripping hazards should be dealt with immediately to prevent accidents. In order to increase your carpets lifespan, lower-traffic areas need a minimum of weekly cleaning, and high-traffic areas need to be done at least twice a week. Dirt particles are sharp and abrasive and often can't be seen easily. The more they are ground in over time, the more damage they do to carpet fibers. New carpets should be unrolled prior to installation to let gasses escape. When bidding equipment such as carpet cleaners, specify carpet extractors with a light extraction mode which uses less water and reduces mold growth in carpets. Vacuums should use HEPA filters.

Hint: To give carpets a fresh scent without artificial sprays or chemicals, place a cotton ball soaked with an essential oil (clove, orange, etc.) in the blower compartment of your vacuum. When spot cleaning, clean in 4 directions to keep the fibers going in the right direction.

Carpet and Rug Institute
http://www.carpet-rug.org/drill_down.cfm?page=2&requesttimeout=350

Ceilings (N)

Ceilings should not have visible water stains, rust stains, water damage or mold. They should be free of chipping and peeling paint or loose, cracked or falling ceiling materials. Since roofing and building envelope issues are often the cause of ceiling damage, it is necessary to maintain your roof as well. Even with good roof maintenance, leaks can be evasive so a leaking strategy might simply involve watching weather reports for rain, and placing buckets where needed. Building checks might be necessary to catch water-leaking problems whenever the building is closed for the evening or weekend and high winds and rain are anticipated.

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-378.htm

Chemical Maintenance (A, N)

Since the disposal of chemicals can greatly affect a department's budget, it is important to keep disposal costs in mind when purchasing products. If you purchase chemicals annually, stock rotation should be used and only those chemicals that will be used during the year should be purchased. Expiration dates should be noted on the product and when unsure, and shelf life information should be checked with the vendor. If the labels can be damaged during use, they should be covered in a clear plastic tape when placed in inventory to prevent damage during use. Inventories should be maintained, rotated and updated annually, disposing of all outdated products in a proper manner. All chemicals should be stored properly. Although storage is always an issue in most facilities, chemical products such as cleaning supplies, etc. should not be stored in electrical rooms or boiler/burner rooms since they usually require a cool, dry storage area. All employees should be trained in the proper use of cleaning chemicals, pesticides, and any other chemicals they may use as part of their employment – never mixing chemicals unless carefully following the label directions. Food and beverages should be prohibited in areas where chemicals are handled and stored. Material Safety Data Sheets (MSDS) sheets should be readily accessible and located in an area that all employees have easy access to. A hazard communication plan should be in place in the event of a chemical accident. The number for **Poison Control is 800-222-1222**.

The workplace portion of the Mass Right to Know law requires that information on chemical hazards be given to employees by providing them with access to Material Safety Data Sheets (MSDS), by labeling containers of chemicals and by training on chemical hazards and safe work procedures. Posters must be present. The Division of Occupational Safety has PowerPoint presentations, model policies and other information available.

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

Chemical Storage (N)

Storage shelves should have anti-roll lips. Chemicals should not be stored on floors if moisture can affect the product or become reactive with the container. Chemical storage rooms should have venting through a mechanical exhaust system. The storage room door should be locked, and hazmat and flammable locking cabinets should be purchased for those flammable and corrosive chemicals that require more secure storage. A comprehensive chemical inventory list and disposal log should be on hand and updated annually. A duplicate set should be kept in an easily accessible area to hand to the fire department should the need arise. All chemicals should be stored according to chemically compatible families. Chemical spill kits should be available but only used by properly trained employees. When in doubt, call in a professional to evaluate the situation.

Chillers (B)

Check the chiller condenser. Purge air. Check flows and pump service. Check compressor oil. Check refrigerant level and pressure. If available, check manufacturer's requirements for preventive maintenance.

Chloro-Fluorocarbons (CFC) (Refrigeration)

Composed of carbon, fluorine, chlorine, and hydrogen. CFC's are manufactured under the trade name Freon. They have been used extensively as aerosol-spray propellants, refrigerants, solvents, and foam-blowing agents. CFCs have been found to pose a serious environmental threat, and because of a growing concern over ozone, a ban was imposed on the use of CFCs in aerosol-spray dispensers in the late 1970s by the United States.

Chlorofluorocarbons - CFC's
http://www.c-f-c.com/supportdocs/cfcs.htm

Clean Air Act (CAA)

The federal Clean Air Act charges the U.S. Environmental Protection Agency (EPA) with setting limits on the amount of a pollutant that can be in the air anywhere in the United States.

MA Department of Environmental Protection
http://www.mass.gov/dep/air/

MA Office of Coastal Zone Management
http://www.mass.gov/czm/envpermitcleanair.htm

Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&sid=Eeohhs2

Combustion Equipment

Where combustion appliances are present, carbon monoxide monitors might be required. See Carbon Monoxide for new state regulation.

Concrete (A)

Visually inspect concrete for deterioration in structures built more than 40 years ago, and any degradation due to improper maintenance. Corrosion of the internal reinforcing steel should be monitored if you are able. Look for rust stains on slab edges indicating corrosion. Cracks that will allow for water intrusion. Peeling paint or coatings should be maintained and failed sealants should be replaced. Examine loose or delaminated tile or decking, lumps under carpeting, loose grout at any post pocket, leaks around doors or windows, wet/damp interior carpet near exterior walls, damp or musty odors, and damp or wet drywall near exterior walls or openings. Maintenance includes waterproofing your structure before you have a problem or something as simple as concrete patching.

Confined Spaces

A confined space is a space that is large enough for a person to enter, has a limited means of entry or egress and is not designed for continuous human occupancy. Confined spaces in public works include but are not limited to; water and sewer pipes, pumping stations, manholes, meter vaults, tunnels, tanks, wastewater wetwells, grit chambers, utility tunnels, crawl spaces under floors, trenches, water reservoirs, holding tanks, and pits. Both atmospheric and physical hazards may exist in confined spaces. Hazardous atmospheres include the lack of sufficient oxygen or the presence of toxic vapors such as hydrogen sulfide or explosive vapors such as methane. Atmospheres that are safe one minute may become fatal the next. Physical hazards in confined spaces include mechanical and electrical sources, or entrapment or engulfment by solids or liquids. No confined space should be entered without first knowing the hazards involved. Most confined spaces have the potential for both atmospheric and safety hazards. All entries must be carefully planned. Entry may involve the use of blowers, tripod, harness winch systems, and the use of atmospheric testing equipment. Contact the Division of Occupational Safety at 617-969-7177 for further information.

MA Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-405.htm

OSHA
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9797&p_table=STANDARDS

Contractor Management

Facilities should develop and communicate the roles, responsibilities, overall requirements and accountability mechanisms for outside contractors. Determine what degree of supervision makes the most sense. Consider establishing site work rules to communicate facility procedures that may be more stringent than regulatory requirements, or emphasize procedures particular to your organization. Make them aware of any site hazards, emergency procedures and any site specific work rules in writing.

Cooling Towers (A,B)

Check air intakes and eliminators and sprayer heads for blockage. Service fans. Clean sump of all biological organisms. Maintain chemcial treatment annually.

Cross Connection Control – Backflow Prevention (A)

A cross-connection plan should be developed by a MA-Certified Cross-Connection Surveyor, approved by the DEP and kept up to date. Any known cross connections should be eliminated or properly protected by a Reduced Pressure Backflow Preventer or a Double Check Valve Assembly installed by a MA-licensed plumber and tested annually by a MA-Certified Backflow Prevention Device Tester.

Mass DEP
http://www.mass.gov/dep/water/drinking/welltips.pdf

MassDEP Contacts: Water & Wetlands
http://www.mass.gov/dep/about/organization/watcon.htm#gw

Custodial Closets

Closet doors should be equipped with an operable lock and access should be restricted to authorized individuals at all times. If equipped with an operating exhaust fan, it should be checked and maintained annually. Material Safety Data Sheets (MSDS) should be readily accessible to staff for all hazardous chemicals used or stored in the custodial closet. If the MSDS sheets are not stored in the individual closets, a sign should be posted stating where they are stored. The MSDS sheets should be readily accessible in the event of an emergency.

Demand Response

The Massachusetts Division of Capital Asset Management, Office of Facilities Maintenance is administrating the Demand Response Program to state operated facilities. The purpose of the program is to develop a list of eligible state agency participants who, when requested, can operate their own electric power generators in an effort to reduce their draw of electric power from utility providers. The contractors providing the registration, monitoring and notification services are paying state facilities both for their enrollment and participation in the program. Interested persons should contact Mark Nelson, Deputy Commissioner, DCAM-OFM at 617-727-4050 extension 237 for enrollment information.

Doors (A)

Exterior doors should be checked for air leaks. Sweeps should be replaced when worn. Weather-stripping and autoclosers should be checked annually.

Drain Traps (W)

For drain traps that are not frequently used, pour water down floor drains once per week (about 1 quart of water). Once you run the water, add 1cup of vegetable oil to inhibit water evaporation. Run water in sinks at least once per week (about 2 cups of water), flush toilets once each week (if not used regularly).

Drinking Water (A)

If your facility uses water coolers and bottled water, rental units should be swapped out and sanitized annually. When you replace the bottles, you should check to see that the water well shows no indication of algae growth or other contamination. Bottles should not be stored near chemicals or other hazards. In facilities where children are present, the local water provider will often test the sanitary water outlets for lead or other contaminates on a regular basis. If you facility depends on wells for drinking purposes, water should be tested at regular intervals according to regulatory requirements.

MA DEP
http://mass.gov/dep/water/drinking.htm

EPA
http://www.epa.gov/safewater/sdwa/basicinformation.html

Electrical

All electrical boxes should contain circuit breakers that are clearly marked. Access to the boxes should not be obstructed and should be accessible to only those people who need access to them and through a locked door. Electrical rooms should not be used as storage areas. Master shut-offs should be clearly marked. Treat all circuits as if they were live. When working in a live situation, do not work alone. Electrical work should only be performed by a licensed electrician. Insulation should be provided by rubber soles, insulated tools and insulated work and floor surfaces. Ladders should not be made of metal. The main contacts in an electrical building should be cleaned periodically (check with your electrical utility).

Elevators/ Escalators (A)

Should be inspected annually by the MA Department of Public Safety. Repairs should be made as needed. Contact your vendor for service.

Department of Public Safety
http://www.mass.gov/dps/elevator.htm

Emergency Lighting (M)

Should be tested monthly when the generator is tested.

Emergency Preparedness and Response

Emergency procedures should be in place to cover any situation (hazardous material issues, fire emergencies, natural disasters, bomb threats, utility outages, etc.) that may occur after hours or during times when the administrators are not available. Phone directories should be maintained and updated as necessary and distributed to those people needing the information. It is important to know the chain of command during emergency situations.

MA Emergency Management Agency
http://www.mass.gov/?pageID=eopsagencylanding&&L=3&sid=Eeops&L0=Home&L1=Public+Safety+Agencies&L2=Massachusetts+Emergency+Management+Agency

Department of Public Health
http://www.mass.gov/dph/topics/bioterrorism/bt.htm

MA Operational Services Division
http://www.mass.gov/Aosd/docs/otherforms/EmergencyResponseSuppliesBookletRev7_060106.doc

Homeland Security
Office of State and Local Government Coordination and Preparedness (Copy and Paste this link into your browser)
http://www.ojp.usdoj.gov/odp/docs/slgcpfactsheet.pdf
Exercises
http://www.ojp.usdoj.gov/odp/exercises.htm
Lessons Learned and Information Sharing
http://www.ojp.usdoj.gov/odp/llis.htm

BOMA
Addressing the Threat to Commercial Buildings of an Avian Flu Epidemic
http://www.bomatoronto.org/pdfs/BOMA_Toronto_Pandemic_Workbook_2006.pdf

Energy Efficiency – Sustainable Design

Proper and timely maintenance of HVAC, lighting and envelope systems is a very cost effective means of reducing energy consumption. In addition, since energy costs are always a burden to any budget, procurement should favor the purchase of products carrying the Energy Star rating, including compact fluorescent lamps, equipment, motors, office equipment, computers and other devices. Disposal of these items should be handled in an environmentally acceptable way following all legal requirements. There is power monitoring software available if you find the need.

On August 11, 2006, the Executive office of Administration and Finance issued three notices (A&F Bulletins 11, 12, and 13) which direct all lExecutive Agencies to initiate certain actions to reduce energy consumption. A&F Bulletin 11 directs all agencies to reduce building energy consumption by 15% by 2010. A&F Bulletin 12 directs all agencies to adhere to certain energy efficiency and sustainable design standards when renovating or constructing new buildings set by the U.S. Green Building Council's LEED standard.

A&F Bulletin 13 directs all agencies by FY2008 to use a minimum of 5% biodiesel in both on-road and off-road diesel engines and by FY2010 use a minimum of 15% biodiesel.

Executive Office of Environmental Affairs - MA DEP
http://www.mass.gov/envir/Sustainable/compliance/CSI_Accomp.htm

US General Services Administration
http://gsa.gov/Portal/gsa/ep/contentView.do?P=MPW&contentId=9837&contentType=GSA_OVERVIEW

MA Operational Services Division – Environmentally Preferable Products (EPP)
http://www.mass.gov/portal/site/massgovportal/menuitem.3b4ee5b1fa7a31c14db4a11030468a0c/?pageID=osdterminal&L=3&L0=Home&L1=Buy+from+a+Contract&L2=Green+Products&sid=Aosd&b=terminalcontent&f=osd_es_green&csid=Aosd

U.S. Department of Energy – 20 Ways to Save Energy Now
http://www.eere.energy.gov/consumer/industry/20ways.html
http://resourcecenter.pnl.gov/cocoon/morf/ResourceCenter

U.S. Green Building Council
http://www.usgbc.org

Division of Capital Asset Management-Energy Conservation
http://www.mass.gov/cam/statewide/sw-energyconserv01.html

Northeast Sustainable Energy Association
http://www.nesea.org

Entry Mats

Walk-off mats should be at every entrance. They should be clean and dry, and lie flat on the floor with no slippage. Should the area around them become wet, wet floor signs should be posted. They will prevent dirt from traveling into the building making cleaning easier.

Ergonomics

Ergonomics can affect the delivery of services and safety in the work place. Surveys should be done to identify the necessary accommodations to reduce risk while improving employees' comfort. The Human Resource Department offers a Free Work Smart Ergonomics two hour class. Call them at 617-878-9827 for locations and dates. Additionally, the Division of Occupational Safety can assist in workplace evaluations through their Occupational Hygiene Program. You can reach them at 617-969-7177.

U.S. Department of Labor ©© Occupational Safety & Health Administration
http://www.osha.gov/SLTC/ergonomics/

Exhaust Vents (N)

Make sure that they are always cleared and clean as frequently as needed. Check them after snowstorms for blockages.

Exits

All exits should be properly marked. All exits and exit corridors should be free of obstructions that would restrict or prevent emergency egress from a building. Exit bulbs should be replaced immediately when they burn out. Retrofitting or replacing with LED fixtures can decrease electrical costs. It is also recommended that exit signs be installed 6-8" off the ground so that in the event of an emergency involving smoke, they can be easily seen by anyone at the ground level. It is also recommended that if your clientele's predominate language is other than English, signs should be posted in that language as well.

Eye-Wash Stations (W)

Should be located within 10 seconds or less or no more than 55 feet of any chemical workstations including maintenance garages. They must not be through a doorway and have no obstructions in the pathway. They should be activated weekly. Ideally the water should be tepid (60-100 degrees F). If the units are free standing they should be checked monthly for cleanliness, or if possible covered with a plastic bag until needed. Units attached to sink faucets should be kept clean and clear of clutter. Staff should be trained on their usage. Portable handheld eyewashes are NOT considered acceptable eyewashes but can SUPPLEMENT the plumbed-in eyewashes or a stand alone eyewash that provides at least 0.4 gallons per minute for a minimum 15 minute flush. (ANSI Eyewash Standard ANSI Z358.1-2004)

Fire Alarm System (M)

Test monthly. Call immediately for service when a problem arises.

Fire Codes

Fire codes and regulations vary by institution and situation. Please consult with your local authorities, MA Department of Fire Services or legal counsel for clarification on any specific questions you might have.

MA Department of Fire Services
http://www.mass.gov/dfs/index.shtm

NFPA
http://www.nfpa.org

Fire Extinguishers (M, A)

Fire extinguishers should be checked monthly (replace any that have disappeared) and serviced annually. Their locations should be clearly marked and easily accessible. They should be tagged to show when they were last serviced. If possible it is best to keep a floor plan showing the location of each fire extinguisher for inspection purposes. CAMIS can be used to keep track of your fire extinguishers by location.

Fire Hydrants (N)

Make sure they are cleared during snow and attach markers so that they can be located easily. If they are not working, cover them with a secured plastic bag or tag them as out of order.

Fire Proofing (A)

Wherever there is a gathering of people (auditoriums, meeting rooms) all curtains and fabric wall hangings must be fireproofed annually. Keep a copy of the certificate of fireproofing on file in a central location, with the original given to the local fire authority. You can find more information at 527 CMR 21.00.

Board of Fire Prevention Regulations
http://www.mass.gov/dfs/osfm/fireprevention/cmr/527021.pdf

Fire Sprinkler Systems (M,Q,A,N)

Monthly inspections should include reading and recording numbers of pressure gauges and making sure control and alarm valves are easily accessible, undamaged and in the proper position. Systems with a backflow preventer should be tested quarterly;

without a backflow preventer they are required to undergo a main drain test every year. Inspections for damaged heads should be done annually and, additionally, whenever staff works on a ceiling. In areas where the piping might freeze, it should be insulated. When sprinkler heads are replaced, it is important to make sure that the shut-off valve has been turned on once the work is done. All work must be done by a MA licensed Fire Sprinkler Fitter/Contractor.

Is your building really safe? Defective sprinklers still in use

Despite a government recall of 35 million defective fire sprinkler heads more than four years ago, more than two-thirds of them remain in use according to a Feb. 12, 2006 article in *USA TODAY*. The sprinklers, used in nursing homes, hospitals, schools and other buildings, were sold under the brand names Central, Star and Gem, which are all owned by Tyco now. The rubber O-ring in the sprinklers' valves can corrode and prevent the release of water. There have been several claims of property damage but no deaths or injuries related to the recalled sprinklers. (from IFMA Insider, February, 2006)

First Aid Kits

Although first aid kits should never be substituted for proper medical care, there should be kits available where needed for simple problems. Small kits can be located in each vehicle used by maintenance, shop areas, garages and the facility office. If an injury requires medical attention, the employee should fill out an accident report for the incident and forward it to the proper administrator.

Floors (W,N)

Floors should be smooth, wear resistant and easily cleanable. They should be kept clear of obstructions for cleaning and maintenance purposes. Frequent dusting, mopping, and scrubbing is less costly and time consuming than allowing the dirt to accumulate. Prevention will extend the life of the floor. Select cleaning products that work quickly and effectively and floor finishes that last as long as possible. By focusing on high traffic areas to prevent soil from wearing out the floor finish, you will spend less time chasing dirt through other areas of the building. Cleaning, stripping and refinishing should be done when it will least impact people in the building. Don't skimp on floor finish so that it will protect the floor for a longer period of time. Softer wax finishes offer more shine but are high maintenance. Harder waxes last longer but aren't as shiny. They are recommended in areas with snow and slush. Although some of these finishes will cost more initially, labor savings more than outweigh those costs. Signage is necessary where floors are wet due to cleaning, snow, rain or icing situations. When possible, mats at the entryways will prevent water and dirt from being tracked into the building. Choose an easily maintained mat that remains flat and is of adequate size for the area. See Entry Mats.

Hint: Pencil erasers or a tennis ball on a stick will lift heel marks from floors.

Foundations (B)

All gutters and downspouts should direct water away from the foundation. Plant growth should be trimmed at least five feet from the building. No plants should be present at the foundation/apron junction. The sealing compound in this area should be continuous and in good repair.

Freezing Prevention

During the winter months, maintain heat at between 55°-60° on off-hours. Perform a building check daily during long periods of cold. Keep items off of univents so air can circulate. Check freeze stat controls on univents to prevent freezing. Make sure dampers are not stuck open. Set circulator pumps to run continuously, even when not calling for heat when long periods of cold are expected. Protect cold areas with low temperature alarms. Insulate exposed pipes especially above dropped ceilings. If possible, install glycol in system, and have it checked annually. During an especially long cold snap, let the faucets drip when the building is not occupied.

To prevent frostbite, employees who work in the freezing weather should dress in layers and cover up. Take short breaks indoors or near heat generating equipment. And, know the signs of frostbite: numbness or loss of feeling; uncontrollable shivering; weakness; slurring of speech and white, gray or blue skin.

Furnace (Forced Hot Air) (N)

Filters are a critical component to remove particles from the air before they enter the system ductwork. The higher the efficiency, the smaller the particle they will trap. Filters in high humidity areas may require more frequent changing due to microbial growth. Annual maintenance is needed prior to the heating season following manufacturer's recommendations, such as cleaning of ductwork, oiling of motors, fans, etc. Change filters more often as needed. Check shafts for wear. Inspect exchanger for deposits and fouling, clean cabinets and plenums.

Gas Appliances

Should be installed by a licensed plumber. They should be vented to the outdoors and working properly. Vents should be inspected annually to make sure they are not blocked. During snowstorms, they should be checked to make sure piles of snow do not block them. Small clothing dryer hoses and vents need to be cleaned annually. Commercial units should be cleaned according to manufacturer instructions. Check the new Carbon Monoxide regulations for CO detector requirements.

Gas Leaks

When there is the smell of gas, always contact the Gas Company. Thus, it is important to have the proper phone number readily accessible to report a gas leak. Depending on the severity of the smell good judgment should be used to determine if you could handle it yourself or call a plumber or call the fire department if necessary.

Generators (M)

Test monthly. Make sure they are properly vented and that the vents are checked for obstructions when tested. Make sure the vents are cleared during snowstorms and inclement weather. Records of generator operation should be maintained on site. Diesel fuel can deteriorate over time and is not easily noticed. This can prevent your generator to start when you need it.

Grease Traps (M,Q)

Clean quarterly, or when the effective depth of the grease reaches 25%. They should be inspected monthly. Check the OSD tradesperson list for service pumping and drain cleaning companies.

Grounds

Whenever possible, mulching mowers should be used to eliminate the need of composting. If clippings are abundant, a composting site should be utilized to keep clippings out of the waste stream. Blowers should be used to keep walkways clear of clippings. Clippings should be kept away from foundation areas. Puddling near any building should be checked and eliminated where possible. Maintenance vehicles should not be allowed to idle near the buildings. All areas should have sufficient lighting. Walking areas should be free of excessive cracking or uneven pavement. If walkways are dangerous, cordon them off, or obstruct them in a noticeable way until repairs can be done. Grounds should be free of trash or excessive litter.

Groundwater Contamination

There should be no dumping of gasoline, oil, chemicals, lawn and garden pesticides down the drain, into or near surface water, onto the ground or disposal into the trash. All chemicals should be disposed of properly in accordance with federal, state and local guidelines.

Gutters, Downspouts, Scuppers and Storm Drains (A, N)

Should be free of evidence of storm water overflow or obstructions. There should be no standing water or debris in gutters. Downspouts should drain to a storm sewer or visibly sloped grade. They should be checked annually and after each storm (wind,

snow, rain) to ensure they are properly connected. Gutters should be cleaned out in the fall after surrounding trees are leafless and in the spring after the snow melt.

Hallways and Stairwells

These areas should be clear of all obstructions and should not be used as storage areas. In the event of an emergency they should have adequate emergency lighting and signage if used as emergency exit.

Hazard Communications Program – Employee right to Know

The Right to Know Law only applies to State, county and municipal workplaces in Massachusetts.
The workplace portion of the Mass Right to Know law requires that information on chemical hazards be given to employees by providing them with access to Material Safety Data Sheets (MSDS), by labeling containers of chemicals and by training on chemical hazards and safe work procedures

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

OSHA
http://www.osha.gov/as/opa/worker/rights.html

Hazardous Energy Sources (Lock-out, Tag-out)

Any electrical, hydraulic, pneumatic, chemical, thermal mechanical equipment that is not cord and plug type must be locked out prior to servicing or maintenance. These are the practices and procedures necessary to disable machinery or equipment, preventing the release of hazardous energy while employees perform servicing and maintenance activities.

OSHA
http://www.osha.gov/OshDoc/data_General_Facts/factsheet-lockout-tagout.pdf

Hazardous Waste –Resource Conservation and Recovery Act (RCRA) (A)

Hazardous waste (waste oil, chemicals, etc.) removal should be scheduled annually. Disposal costs are based on the type of chemical and can become quite costly. An annual disposal schedule allows for budgetary planning and control. Emergency or dangerous situations should be dealt with immediately. Operational Services Division has a list of vendors, which should be kept readily accessible in case of emergency. The annual disposal of chemicals warrants that the chemicals are stored properly and secured in an area that has controlled access. The State vendors will often come out and evaluate your storage area, recommend best practice, and estimate costs for removal of the chemicals while waiving associated fees or for a modest fee. The Department of Environmental Protection is a good resource for information.

U.S. Environmental Protection Agency
http://www.epa.gov/rcraonline/

Commonwealth of Massachusetts Department of Environmental Protection
Toxics and Hazards
http://www.mass.gov/dep/toxics/
Hazardous Waste Management
http://www.mass.gov/dep/recycle/hazwaste.htm

Commonwealth of Massachusetts Operational Services Division

http://www.mass.gov/?pageID=osdhomepage&L=1&L0=Home&sid=Aosd

Hazardous Waste Operations and Emergency Response (Hazardous Materials Release Plan)

The emergency response operations for releases of, or substantial threats of releases of, hazardous substances.

OSHA
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765

Commonwealth of Massachusetts – Department of Public Health Emergency Preparedness & Response Advisory Committee
http://www.mass.gov/dph/bioterrorism/advisorygrps/decon_minutes_12_02.htm

Heat Pumps (B)

Check unit cooling cycle in the spring and heating cycle in the fall. Clean inside and outside coils. Check fans, motors and bearings for wear and lubrication, check refrigeration levels pressures and temperatures. Check coils and clean if necessary. Check thermostat, discharge air temperatures, condensate drain pan and line for proper drainage. Check compressor oil.

Hot Water (Domestic) (A)

Check annually. Drain any sludge of bottom at least once a year, or according to manufacturer's recommendations.

Humidifier System (A)

Check annually, and clean prior to the winter season. Portable humidifiers are generally not recommended since they can generate bioaerosols if not properly maintained. Proper care and cleaning of ultrasonic and impeller humidifiers are important for reducing potential exposures to microorganisms, such as bacteria and molds. Microorganisms often grow in humidifiers which are equipped with tanks containing standing water. Breathing mist containing these pollutants has been implicated as causing a certain type of inflammation of the lungs.

HVAC Systems (A, N)

When possible, these systems should be free of excessive noise or vibration from any system component. Unusual noises should be checked for service needs. Air filters should be properly sized and installed, and replaced when dirty. When there are construction or renovation projects going on, filters may need to be changed more often. When an offensive odor is detected from any system component, it should be checked for dirt or bacterial growth. Thermostats should be in working order and replaced when broken. If necessary, they might need to be covered with a locking device to prevent vandalism or misuse. All systems should be free of mold or other debris and air supply diffusers and return grilles should be clear and unobstructed. Unit ventilators should not be obstructed by books, boxes or other items and should not be used as a storage area. Filters on these units should be changed a minimum of twice a year and checked more often and replaced as when needed. Fans should be checked to make sure they are operating properly and repaired/replaced when they are not. Overall maintenance should include minimizing nuisance alarms, trending and recording setpoints vs. control points, calibrating pneumatics, and checking and calibrating air compressor. See Ventilation.

Ice Machines (Q)

Clean condenser coils quarterly. Oil motors and fans as directed by manufacturer. Check drain pan for blockages.

Indoor Air Quality

IAQ can be a difficult and touchy subject. Listen carefully to building occupants and get facts without scaring people or making any guarantees. Changing HVAC filters as required can alleviate some of the complaints. How often you change them is something that is specific to each facility. Things to remember are that if any construction projects are being done (indoors or outdoors) filters may need to be changed/cleaned more frequently and should be checked more often. Filters are a quick and reasonably priced fix for many air quality issues. If air quality tests are to be done by a professional, it is often necessary to do an outdoor test as a baseline for your building purposes. An example of this would be if someone complains of an allergy and you are testing for a specific allergen indoors, an outdoor test would also be required. If both tests come back with the same (or close) reading, there is not an indoor problem for that allergen. All tests should be kept on file to be used as future reference. Objectionable and unusual odors (mold, mildew, sewer gas, etc.) should be checked for the source when they are detected. Temperature and humidity should be within acceptable ranges using ASHRAE standards. Ventilation systems should be delivering appropriate amounts of outside air. Causes of poor indoor air quality can include restricted or ineffective ventilation, poor humidity control, poor maintenance, inadequate filtration, microbiological accumulation, indoor pollutants (copiers, carpets, cleaning chemicals, etc.). Prevent vehicles from idling in the vicinity of air intakes. When making repairs, use low VOC paint products if possible. Do not over-react to complaints by attempting to clean air ducts. Scope ducts for problems, but clean them only in extreme cases of contamination. HEPA filter vacuums will reduce dust particles.

Commonwealth of Massachusetts – Division of Occupational Safety
http://www.mass.gov/dos/iaq/index.htm

Commonwealth of Massachusetts – Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&sid=Eeohhs2

Environmental Protection Agency
http://oaspub.epa.gov/webi/meta_first_new2.try_these_first
Fundamentals of IAQ in Buildings
http://www.epa.gov/iaq/largebldgs/i-beam_html/ch1-fund.htm#Overview%20of%20Indoor%20Air%20Quality%20in%20I-BEAM

Indoor Athletic Facilities (A)

Bleachers should be checked annually for safety reasons. Floor mats should be cleaned on a regular basis using manufacturer recommendations. There should be protective matting on the walls behind the basketball hoops. The conditions of the mats (both floor and wall) should be checked for conditions at least twice a year with any tears or holes repaired according manufacturer instructions. (Often this simply requires using a wide, industrial tape of the same color – rounding corners will prevent peeling.) Gym flooring should be dry mopped before and after every use. Wooden floors should be refinished annually. It is not necessary to strip the floors; roughing the surface and applying a new finish is adequate. See Stadiums, Bleachers and Grandstands.

Integrated Pest Management

MASSACHUSETTS STATE LEGISLATURE'S DEFINITION OF IPM

A comprehensive strategy of pest control whose major objective is to achieve desired levels of pest control in an environmentally responsible manner by combining multiple pest control measures to reduce the need for reliance on chemical pesticides; more specifically, a combination of pest controls which addresses conditions that support pests and may include, but is not limited to, the use of monitoring techniques to determine immediate and ongoing need for pest control, increased sanitation, physical barrier methods such as adding sweeps to the bottom of doors., the use of natural pest enemies and a judicious use of lowest risk pesticides when necessary. When bidding products specify equipment that improves IAQ.

U.S. Environmental Protection Agency
http://www.epa.gov/pesticides/ipm/

Massachusetts Department of Food and Agriculture
Schools
http://massnrc.org/ipm/

Irrigation Systems (A)

Should be blown out in the fall each year, prior to the first frost. . If the lawn area is sprinkled, it should be timed to go off in the early morning hours or once the sun has set. The key to successful watering is to water deeply and infrequently to help the vegetation to develop an extensive, deep root system.

Insulation

When possible, check insulation when there is water damage from leakage or condensation. Remove insulation when it becomes wet, and replace it once the damage has dried out. All water damaged materials should be removed within 48-72 hours if it cannot be dried.

Intrusion Alarm (Q)

Test quarterly. Call for service immediately when problems arise.

Kitchen Hoods (A)

Should be cleaned annually. Extinguisher systems should also be inspected by a licensed/certified professional annually.

Lawn Areas

Whenever possible mulching mowers should be used. Lawns should be mowed frequently enough so as not to leave behind large amounts of clippings. If clippings are in great amounts, they should be gathered and composted in a remote area. If the lawn area is sprinkled, it should be timed to go off in the early morning hours or once the sun has set. The key to successful watering is to water deeply and infrequently to help the vegetation to develop an extensive, deep root system. Chemicals should meet the MA Outdoor Integrated Pest Management guidelines.

Lead in Drinking Water (A)

A plumbing survey should be conducted to locate areas of high risk for lead sources. Drinking fountains should be checked against the EPA's list of known lead-containing models, and taken out of service or removed. Buildings containing children must test for lead at least annually. Any questions should be directed to your water provider. Often, flushing out (flushing toilets, opening all taps) at the start of each day will remediate the problem for all drinking and cooking water outlets with high lead levels.

Mass DEP
http://www.mass.gov/dep/water/drinking/lead01.htm

MWRA
http://www.mwra.state.ma.us/04water/html/qual6leadinfo.htm

EPA
http://www.epa.gov/safewater/lead/index.html
http://www.epa.gov/safewater/schools/pdfs/lead/qrg_lcr_schools.pdf

Lead Paint

There is a strong likelihood that buildings built prior to 1978 will contain lead paint. It is important to be aware of lead paint issues in any area(s) where there are children age six (6) and under. A professional should assess any activities that may disturb areas containing lead paint hazards. If the facility has housing for children under six (6) years old, the units must be deleaded by a licensed deleading contractor. Assessments should be done by an occupational health professional (i.e. and industrial hygienist). Remember, adults as well as children can be lead-poisoned if proper precautions are not taken when lead paint is disturbed.

Commonwealth of Massachusetts-Health and Human Services
Massachusetts Lead Law Information
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Government&L2=Laws%2c+Regulations+and+Policies&L3=Department+of+Public+Health+Regulations+%26+Policies&L4=Regulations+and+Other+Publications+-+I+to+L&L5=Lead+-+The+Massachusetts+Lead+Law+and+Legal+Documents&sid=Eeohhs2

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/lead/index.htm

EPA
http://www.epa.gov/lead/

National Lead Information Center
http://www.epa.gov/lead/pubs/nlic.htm

Licenses Required

MA Licensee Information
http://www.mass.gov/?pageID=ocatopic&L=3&L0=Home&L1=Licensee&L2=License+Types%2c+Forms+%26+Requirements&sid=Eoca

Lighting

Lighting can be 30-60% of your energy costs. Unless you are able to replace all of your lighting as part of an energy saving program, repairs should be made with low energy ballasts, low energy fluorescent lights and fixtures; replace incandescent lights with energy savers when ever possible. When possible, motion detectors, photo sensors, timers and combination switches should be considered during routine spot replacement. Cleaning or replacing diffusers and installing reflectors can increase light efficiency. Emergency ballasts can be installed, making your fluorescent lights emergency lights for 90-120 minutes. These can be installed along corridors or other key escape pathways. Keeping your fixtures, bulbs and diffusers clean of dust accumulation will keep their output consistent.

Loading Docks

Loading dock areas should be clearly marked by signage from the entryway to the facility. The area should be kept clear of parked cars and clutter. Dumpsters should not obstruct access to the loading dock. Due to fume issues, vehicles should be turned-off while off-loading materials. There should be a proper bumper pad to prevent damage to the facility. Access to the facility through the loading dock area can creat security issues. Policies about deliveries, schedules, and other security items of concern should be instituted.

Locker Rooms

Since the high moisture of locker rooms promotes the formation of mold and mildew, proper cleaning is essential. Exhaust fans should be operable and maintained according to manufacturer's instructions. Drain traps should be clear and serviced

immediately when blocked. Showers should not be used as storage areas. Shower hot water temperatures should be maintained at 112°F. Showerheads should be low flow. Check your local water utility to see if they have any retrofit programs available.

Material Safety Data Sheets (MSDS)

Should be on file for all products used by the facilities. The easiest way to store them is to purchase an MSDS file folder and keep it in an area where everyone has access to it. It should not be locked up, and it should be updated whenever new products are ordered. Many chemicals now have MSDS information printed right on the container of the product but, should also include a paper copy for your folder.

Commonwealth of Massachusetts-Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

MSDS National Repository
http://www.msdssearch.com/

Mechanical Rooms

Floors should be free of all slipping, tripping and falling hazards. They should be free of storage of items that inhibit or restrict routine maintenance. Doors should have operable locks. Access should be restricted to authorized individuals only.

Mercury Assessment, Removal and Prevention

The purchase of mercury products should be prohibited. All devices containing elemental mercury, mercury compounds and mercury solutions (e.g. thermometers, thermostats, manometers, electric switches, floursecent bulbs, etc.) should be replaced (where feasible) with non-mercury devices. Disposal of any devices should be in accordance with federal, state and local environmental regulations.

MA DEP
http://www.mass.gov/dep/recycle/hazardous/mercury.htm
MA Sustainability Program
http://www.mass.gov/envir/Sustainable/resources/Res_main.htm

MA Department of Public Health
http://www.mass.gov/dph/topics/mercury.htm

EPA
http://www.epa.gov/epaoswer/hazwaste/mercury/index.htm

Mold

No wet or damp areas! Indoor relative humidity should be lower than 60% and ideally between 30% and 50% and really low for occupant comfort. Structures should be inspected for visible mold, moldy odors, moisture, stains or discoloration, and water leakage on a regular basis. All moisture and mold problems should be investigated and evaluated. A plan should be developed for high moisture and flooding situations. Since molds are present everywhere, the first 24 hours of a leaking or flooding situation remediation is critical to control the growth of mold. If you don't have the equipment necessary (pumps, extractors, de-humidifiers) to clean a flooded area, it is important to call a service company immediately and by doing so you can often reduce costs associated with mold issues. Check the Operational Services Division site for service companies. Early detection of moisture problems is an important way to prevent mold issues.

Commonwealth of Massachusetts-Division of Occupational Safety
http://www.mass.gov/dos/iaq/index.htm

Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=7&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&L6=Mold%2c+Moisture%2c+and+Mildew&sid=Eeohhs2

EPA
http://www.epa.gov/mold/mold_remediation.html
http://www.epa.gov/mold/moldcourse/

International Center for Toxology in Medicine
http://www.ictm.com/query.idq?CiRestriction=mold&CiSort=rank%5Bd%5D&CiMaxRecordsPerPage=10&CiScope=%2F&HTMLQueryForm=query.htm

National Pollutant Discharge Elimination System (NPDES) (Stormwater)

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Metropolitan Area Planning Council
http://www.mass.gov/envir/smart_growth_toolkit/LID/regional_planning/LID/PDFs/Stormwater_Bylaw_Primer.pdf

MWRA
http://www.mwra.state.ma.us/harbor/html/npdes_091503.htm

EPA
http://cfpub.epa.gov/npdes/

Outdoor Air Quality

There should be an anti-idling policy in place. (This not only improves air quality but saves gas usage as well.) If necessary, signs should be posted. Properly certified personnel should perform service to air-conditioning or refrigeration systems. It is important to be aware of any activities going on around your air-intake vents that may affect the indoor air quality.

Outside Air Intakes (N)

There should be no air contamination sources within 25' of outside air intakes. Intake screens should be checked for obstructions, and free of bird or animal nests and droppings. Painting, roofing or other sealant/coating projects should be scheduled during unoccupied periods.

Paint

It is best to choose a standard paint in a neutral color, which can easily be matched for repair projects. Moisture problems and water damage should be immediately addressed. Chipped or peeling paint and plaster should not be present. Scraping, sanding, and patching a small area is a simple way to keep costs low. Interiors should be repainted every 5-10 years, exteriors every 8-10 years depending on conditions. To prevent air quality issues while painting purchase paint with reduced volatile organic compounds (VOCs). Calcimine painted ceilings can be a problem in older buildings. You can scrub off the calcimine with water, or prime it with calcimine priming paint made specifically for this type of ceiling.

Master Painters Institute
http://www.paintinfo.com/

Oil or Latex Paint? A quick way to tell the difference.

First scrub a small area with a mix of detergent and warm water. Rinse the area with water and dry it with a towel. Soak a soft rag in alcohol and rub it back and forth across the cleaned area. If the paint comes off, it's latex. You can paint over it with a new coat of latex paint. If the paint doesn't come off, then it is oil-based and you'll want to prime the surface first. (Facility Manager's Alert, March 14, 2006)

Parking Areas and Driveways

Vehicles should not be allowed to idle near the buildings. Parking and no parking areas should be clearly marked. Loading and dropping off areas should be away from air intakes. Loading/unloading zones should be clearly marked.

Pedestrian Sidewalks, Walkways and Stairs

Should be intact with no significant cracks, uneven pavement or other tripping hazards. If hazards occur, immediately cordon off or obstruct in an obvious manner. Pedestrian walkways that cross roads, driveways and other areas open to vehicles should be clearly marked. Ice/snow melting chemicals should not be overused. This is not a case where if a little works, more is better! Excessive use will lead to the product being tracked into the building which will increase your cleaning time, dull finishes, become slippery and attract dirt on carpet.

Personal Protective Equipment

Goggles, earplugs and other personal protective equipment should be utilized whenever appropriate. Personal protective equipment should be accessible to all staff that may need it, including but not limited to grounds crew, mechanics, and other maintenance staff. Eye protection is required whenever eye injury could be prevented. Not all eye protection is the same. Impact and chemical goggles, etc. Respirators vary and employees required to wear respirators must be medically screened and fit tested. You must be sure to have the correct type and right filter or cartridge. They must be properly maintained and have a written policy in place.The Department of Occupational Safety and their Occupational Hydiene Program is available for assistance in this area. Please contact them at 617-969-7177.

Commonwealth of Massachusetts-Division of Occupational Safety- Respirators
http://www.mass.gov/dos/iaqdocs/iaq-395.htm

MA Dept of Public Health
http://www.mass.gov/dph/bioterrorism/advisorygrps/decon_program.htm

OSHA
http://www.osha.gov/OshDoc/data_General_Facts/ppe-factsheet.pdf
http://www.free-training.com/osha/ppe/ppemenu.htm

Pest Control

There should be a pest control policy in place, including methods of application and notifications. Chemical applications should be done by a licensed pesticide applicator using only those methods approved by the State. In the case of schools, an Integrated Pest Management policy should be on file with the MA Department of Agriculture. Food should be stored in sealed, vermin-proof containers and all obvious food sources should be managed properly. Screens should be replaced/repaired as needed. All areas should be clean and sanitary.

Playgrounds (B)

Play equipment made of wood should be checked to see if they have been treated with chromated copper arsenate (CCA), if they have, contact the vendor to find their approved method of sealing the wood. If it is impossible to remove the wood, sealing

should be done annually. Wood should never be allowed to the point of splintering or breaking off. Materials of construction should be non-toxic, and non-toxic exterior paint should be used under the manufacturer's directions. Shock absorbing material appropriate for the height of the equipment should be placed under the equipment. Child safe wood carpet, screened and approved shredded tires (all metal has been removed), or other materials approved by the manufacturer should be replaced as needed or annually in the spring. Inspections should be done twice a year. There should be appropriate fall zones for single and double axis swings. "S" hooks should be closed. Swing types should conform to federal, state and local guidelines; the vendor is a good source for this information. There should be no protruding mounting bracket bolts or other components that might catch a child. There should be no openings between 3.5" and 9". There should be no small openings that might catch hood ties or buttons. The playgrounds should be free of all tripping hazards, and all equipment should be free of sharp points, edges or splinters. Guardrails on platforms and ramps should be secure. Safety inspection kits are sold at a minimal cost through most vendors.

US PIRG Nationwide Survey of Public Playgrounds
http://uspirg.org/reports/playground2002/FINALwithAppx.pdf
http://uspirg.org/reports/playground2002/MassachusettsSummary.pdf
US Consumer Product Safety Commission
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9797&p_table=STANDARDS

Public Address Systems/Intercoms (Q)

Should be tested quarterly. Vendor should be called when problems arise.

Radon

Radon is a naturally occurring radioactive gas. It is produced in the ground through the normal decay of uranium and radium. As it decays, radon produces new radioactive elements called radon daughters or decay products. Radon and radon daughters cannot be detected by human senses because they are colorless, odorless, and tasteless.

MA Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=7&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Radiation+Control&L6=Radon&sid=Eeohhs2

EPA
http://www.epa.gov/radon/radonqa1.html

Recycling

An effective recycling program is a good way to reduce disposal costs from your budget. Food waste from cafeteria production, plastic, office paper/newspaper/cardboard, aluminum/tin and glass are easily removed from the waste stream. Working with the facility administrator of the recycling program can benefit the facilities department in a positive way. Although you may not see any of the cost savings returned to your budget, often the good will generated can benefit your department. The US Environmental Protection Agency has a Waste Wise Program which is a valuable resource.

EPA Waste Wise
http://www.epa.gov/wastewise/

Restrooms

All fixtures should be in good repair and operating properly. Water saving devices are an easy way to avoid costs. Floors should be clean and dry. Hot and cold water should be available at all lavatories. Hot water temperature should not exceed 120° F. Sinks are clean, drains unclogged, soap and disposable hand towels or air dryer is present, and toilet paper should be in the proper dispensers. Toilet seats should be secure and properly fitted. Toilet partitions should be secure and clean. You must have lined disposal for sanitary products so there no one comes in contact with blood. Graffiti should be removed or painted over when possible.

Flushometers should work properly with no leaks. There should be no excessive odors and exhaust fans should be in working condition during times of occupancy. If there are showers the hot water temperature should not exceed 112°F. Shower heads should be cleaned periodically to avoid becoming a breeding ground for bacteria. (Fill a small container with cleaning solution/anti-bacterial or diluted bleach and dip the showerhead in it.)

Roofs (M)

Roof coatings should not be applied when the buildings are occupied where possible. Roofs should be free of excessive water ponding, accumulations of organic materials or visible mold and moss growth. Decking materials should be intact and in good condition with no cracks, gaps or openings. Flashings should be intact, and patches and seals should be secure. Roofs should be inspected monthly, being sure your shoes are free of any sharp objects (rocks, twigs, etc.). Roofs should be checked for UV damage, separations from expansion and contraction, flashing failure, valleys, eves and downspouts. Roof drains should be cleared monthly and prior to any predicted storm events. When high winds are anticipated, remove any debris that my blow off the roof. If the roof is under warranty, use approved methods of repair. Always consult the vendor/manufacturer when in doubt. Please note that whenever a vendor is on the roof, there should be a roll-out mat available for them to put their tools on to decrease the possibility of punctures or damage. You should warn the vendor that any unreported roof damage may result in back charges for repair.

Safety Showers (W)

Should be located within 10 seconds unobstructed travel distance or no more than 55 feet of any chemical workstations including maintenance garages. They should be activated weekly to ensure that they are operational.

Shut-off Valves (A)

All shut-off valves for any of the systems should be clearly marked as to what they shut off. Additionally, they should be tested at least annually to make sure they still work as intended. This annual check can prevent problems from developing in the event of an emergency. For example, if the water main shut-off is not working properly, it is possible that the street or neighborhood might have to be shut down to fix a leak.

Sinks

Sinks should be clean and well maintained. Leaking faucets should be immediately addressed. Hot and cold water should be available in all lavatories and maintained at a temperature of 120°F. Drains should be unclogged and soap and disposable hand towels or a drier should be present and maintained. Where possible, low-flow aerators should be used to decrease water flow.

Sky Lights (M)

Should be checked when the roof is checked. Any evidence of leaking should be dealt with when discovered. Repairs should be made until replacement can be budgeted.

Smoke Detectors (Q)

Test quarterly. Call for service immediately if a problem is discovered.

Smoking in Buildings

As of July 5, 2004, all workplaces in the Commonwealth that have one or more employees must be smoke-free

Solid Waste Disposal

Trash/Recycling dumpsters should be located at least 25 feet from building exteriors where possible. They should be clearly marked and sanitized at least once a year. They should be sanitized more often in the hot weather and if used for food. The vendor usually arranges this and will swap out a "smelly" dumpster. Lids should be tight fitting and, in the case of plastic, replaced by the vendor when damaged. They should be kept closed at all times. Often recycling dumpsters will need to be locked so they can't be contaminated by people trying to avoid the costs associated with the disposal of trash when the buildings are not occupied. Check with the vendor to see if they provide locks and chains for recycling dumpsters. When bees become a problem, the vendor can often treat the dumpster or replace it with a cleaner one.

Stadiums, Bleachers and Grandstands (A, N)

Any opening between seating components or guardrail components should prevent the passage of a 4" diameter ball. Bleacher and guardrails should be structurally sound and operational. Guardrails should be present on the backs and the open ends of bleachers where the footboard, seatboard, or isle seats are 30" or more above the ground level and should be at least 42" above the leading edge of the footboard, seatboard, or aisle, whichever is adjacent. Structures should be inspected annually and prior to any scheduled event where the majority of the bleachers and grandstands might be filled. See Indoor Athletic Facilities.

Steam Traps (W, M)

The Department of Energy recommends that steam traps be tested weekly to monthly if they are high-pressure (150 psi and above), monthly to quarterly if they are medium pressure (30-150 psi) and annually if they are low pressure (below 30 psi). Additionally they state that typically the higher the steam pressure the faster the trap fails. If the steam trap strainer is not blown down on a regular basis this contributes to steam trap failure and a losss of energy efficiency.

Department of Energy
http://www1.eere.energy.gov/industry/bestpractices/pdfs/steam1_traps.pdf

http://www.eere.energy.gov/catalog/Scripts/prodList.asp?idSuper=16&showprods=true&browse=prog&Type=12&idCategory=102

Storage Areas

Storage areas should be neat and clean. Paper products should not be stored in electrical or burner/boiler areas due to the possibility of fire. Storage seems to be a problem in most facilities, but safety should be a primary consideration when finding an available space to put supplies. Chemicals and cleaning products should only be accessible to those people using them. Stored items should not inhibit or restrict routine maintenance and cleaning.

Storage Tanks – Aboveground (A)

If aboveground storage tanks are present, spill prevention, containment and countermeasure plans should be on file. They should be inspected annually for potential leaks, and have a containment area around them. Under the right circumstances, a simple "Waterhog" barrier is often sufficient. Prevention is very important since even a small leak can become a major and costly problem.

Storage Tanks – Underground (UST), Resource Conservation and Recovery Act (RCRA)

All underground tanks should be in compliance with federal, state and local Underground Storage Tank Regulations. Consult with your local fire department for these regulations. Pressure tests should be run as recommended by the manufacturer.

MA Department of Fire Services
http://www.mass.gov/dfs/osfm/fireprevention/ust/index.htm

EPA
http://www.epa.gov/OUST/

Storm Drains

Always make sure they are cleared of snow, leaves, twigs and any other debris especially when high rains or melting is predicted. Never pour any chemcials down them. They should be cleaned out annually.

EPA
http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Traffic and Pedestrian Safety

Signage is important to prevent parking and traffic problems. Drop-off and pick-up areas should be clearly marked by signs and color-coded curbing. Handicap parking should be clearly marked and close to accessible entries using American with Disabilities Act, MA Architectural Access Board and local building code guidelines. Parking areas should be properly marked and have adequate lighting. During winter months, walkway and parking areas should be cleared of snow and treated for ice in order to maintain safe walking conditions. Any injuries should be reported immediately to the proper authority.

Utilities

It is important to know where your utilities are located. Using a floor plan of the building, you should mark all shut-off locations, and label them at the site as well. Site plans should be available for vendors to review when they are planning work. Knowing where your infrastructure is located and updating the plans when there are changes or alterations to the services can be helpful for future project planning.

MA Dept. of Telecommunications and Energy
http://www.mass.gov/dte/links.htm

Vacant Buildings

Vacant buildings on active state properties pose a number of operational concerns. A primary risk associated with managing vacant buildings is fire and the injuries and other property damage caused by fire. An equally serious risk is injuries that can be sustained by vandals and trespassers who enter a building that is not suitable for occupants. From an operating perspective, vacant buildings require resources to secure and repair to avoid accelerated deterioration, which can cause the building to become structurally unstable.

While, generally, the long-term goal is to demolish most of the vacant buildings, budgets and schedules dictate that the facilities will need to undertake interim measures to ensure that such structures are secure and protected from trespassers. DCAM's Office of Surplus Property, in coordination with the Office of Planning, Design and Construction, developed recommended procedures for closure of state facilities. The recommendations should be applied to all vacant buildings. The recommendations primarily involve boarding buildings, keeping vegetation away from the buildings and shutting utilities, to the extent permitted by fire codes. Close coordination with local fire departments is highly recommended.

MA Division of Capital Assets Management
http://www.mass.gov/cam/MAFMA/Manuals/Recommended_procedures_for_closure_state_facilities.pdf

Vehicles

Do not allow them to idle near buildings or loading docs. In the winter, make sure the exhaust pipe is cleared of snow before idling.

Ventilation (Q)

Ventilation system should be balanced every five years, and associated documents should be kept on file. Birds should be prevented from perching or nesting near air intakes so that droppings do not contaminate the ventilation system. Restroom exhaust

fans should be in operation during building occupancy and exhaust to the outdoors. All system vents should be operational during building occupancy and clear of obstructions. Any stove hood should be in working order and have sufficient draw to eject cooking odors from the building. If heat exchanger coils exist, they should be cleaned and checked periodically so that there is no microbial growth.

Walls

Bricks and mortar joints should be intact. Wood siding and trim should be intact and scraped and repainted as needed. Edge joints should be properly caulked and sealed. Walls should be free of visible mold and free of peeling, cracked or blistering paint. Spot scraping and repairs should be made when peeling is identified. Walls should be free of visible bowing or structural cracks.

Water Efficiency (N)

All equipment using water should be checked regularly for leaks to prevent damage to the building and prevent mold formation. Newly purchased/replacement equipment should have high efficiency rates. All building systems (chillers, cooling towers, boilers, plumbing fixtures, and cafeteria equipment) should be checked regularly for operating efficiency. A spreadsheet that keeps track of monthly water consumption by usage units can be a valuable tool for detecting irregularities in water use. (If you don't have access to water bills, check with your business office or the local water provider for this information.)

Water Treatment (Boilers) (A)

Should be done annually prior to the start of the heating season. This reduces scaling on boiler tubes and piping and optimizes blowdown frequency. Treatment prevents boiler tube internal metal loss due to corrosion and prevents condensate piping corrosion and iron fouling of boiler tubes.

Windows (B)

Should be properly caulked and sealed. Panes and frames should be intact. Glazed and caulked joints should be intact. Weather stripping should be intact. Window surfaces should be cleaned annually and free of visible mold. Caulking and sealants should be replaced when missing. Window treatments, drapes and blinds should be vacuumed twice a year. Shade devices and awnings should be checked twice a year and repaired where necessary. Check manufacturer's recommendations for cleaning awnings.

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This guidance document is intended to assist facilities maintenance and operations staff in performing their duties. Facilities staff are advised that this document does not constitute legal advice nor does it relieve facilities operators and maintainers of meeting their obligations and responsibilities in performing their job duties. The documents and other references cited in this document reflect information available at the time of its publication; however, it is the responsibility of facilities personnel to ensure that they meet the current and relevant technical, legal and regulatory requirements associated with operating and maintaining facilities.

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Basics of Cleaning

Focus on Entryways inside and out

Since most dirt is brought in on people's feet, it is best to trap and remove dirt before it gets into the building. By frequently cleaning the first 50 – 100 feet at the entrances and cleaning and changing wet mats, you will cut down on dirt inside the building.

Minimize Particles and Chemicals in the Air

Vacuum dirt (preferably with a HEPA vacuum) and apply cleaner to the cloth rather than spraying it on a surface to improve indoor air quality.

Use Environmentally Preferable Cleaning Chemicals

Check out the OSD web site for Environmentally Preferable Products.

Ensure Proper Vacuuming, Extraction, Rinsing and Drying

Carpets can create a host of problems including mold growth when not properly dried, and collecting dirt and dust. When possible, use vacuums with HEPA filters and empty them frequently for increased efficiency. When a rug becomes wet, an extractor should be used as often as necessary to prevent mold growth. If cleaning is necessary during humid times of the year, a microbial should be used to prevent mold growth.

Focus on Preventative Measures and Quick Cleanup of Accidents

Responding quickly will decrease the amount of time spent on cleaning up after an accident.

Mechanically Capture Dirt and Remove it Rather then Moving it Around

Use vacuums, microfiber dusting cloths and flat mops that hold onto the dirt rather than spread it around.

Focus on Touch Points

Door handles and areas where people come in contact with the facility or its fixtures should be the focal point of cleaning.

Apply Disinfectant in Restrooms Properly

Ensure that the chemicals used have the proper dwell time so that soils come off easier and is removed using less product. It is important to follow the directions on the chemicals used. Use a different mop head when cleaning other areas of the building to prevent cross contamination. Never use a bathroom mop head in a kitchen.

Promote Safety and Prevent Cross-Contamination

Proper use and storage of chemicals creates a safer environment. Color code tools to ensure that pollutants don't get transferred from one area to another such as from bathrooms to kitchens.

Use "Green" Paper Products When Possible

If possible, use recycled paper products that are bleached without the use of chlorine.

Recycle!

Make sure that any recycling program is well maintained. People will use the containers if they are readily available.

Communicate

Keep the building occupants informed that they are part of the building operation process. By notifying the maintenance staff of spills, clean-ups, and clutter when it happens, the occupants will help you to ensure that the buildings are properly and well maintained.

Accessibility Issues

Maintenance and Training Schedules

It is important to make sure that the following areas are checked regularly to prevent access barriers.

- Elevators, lifts, emergency evacuation devices
- Automatic door openers and closers
- Intercoms at doors and places of refuge
- Visual and audible alarms
- Microphone systems
- Obstructed pathways
- Light fixtures – bulb replacement

Housekeeping

- Keep areas clear of casual storage (i.e. under sinks, in stalls)
- Remove trash barrels or other barriers in front of signage, elevator buttons, light switches, paper towel dispensers
- Keep walk-off mats in good condition – there should be no curled edges, holes, bumps
- Return all equipment to its "usual" location after use

Cleaning Techniques

- Address slippery floors. Use temporary signage, non-slip floor finishes, walk-off mats in entry ways or where water collects (i.e. elevator areas)
- Keep exterior paths of travel clear and smooth. Install runners and floor mats during wet seasons. Be diligent about snow removal, ice and icy buildups, puddles and potholes, and keep catch basins clear of leaves and obstructions.

ADA Coordinator in the building should be aware of the following:

- Accessible doors that are locked, missing hardware or obstructed
- Pathways used as storage
- Obstructed signage
- After hour entrances should be located in an easily accessible area
- Pay phones that are not accessible or working
- TDD's should be available at public phones and strategic offices with instructions posted nearby.
- Assistive listening devices should be available.
- Storage of devices, distribution of information, training of staff, written instructions for all accessibility issues, periodic inspections should be established and consistent.
- Other equipment should be available (i.e. wheelchairs)
- Maintain a certified interpreter sourcebook.

- Enforce restriction on accessible parking spaces.
- Do not allow curb cuts to be obstructed by vehicles, snow or ice, etc.
- Evacuation procedures should be established and distributed. Fire drills should be conducted to test plans. Share information and train staff and co-workers with disabilities.
- Informational booklets should be available at areas of first contact. Complaint office should be clearly noted at the entries.
- Develop and action plan for grievances and technical problems.

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Maintenance Schedule

This schedule is a condensed view of what needs to be scheduled in your facility and the frequencies involved. Please refer to the individual topics in the manual for more information. Any certification process may require different or more frequent inspection schedules. These are to be considered best practice recommendations however, you are not limited to these recommendations.

Weekly (W)

Drain Traps
Floors
Steam Traps
Eye Wash Stations
Safety Showers

Monthly (M)

Air Conditioners
Emergency Lighting
Fire Alarm Systems
Fire Extinguishers
Fire Sprinkler Systems
Generators
Grease Traps
Roofs
Sky Lights
Steam Traps

Quarterly (Q)

Attics
Carbon Monoxide Detectors
Fire Alarm Systems
Fire Sprinkler Systems
Grease Traps
Ice Machines
Intrustion Alarms
Public Address Systems/Intercoms
Smoke Detectors
Ventilation

Bi-Annually (Twice a year) (B)

Air Handling Units
Break Rooms
Chillers
Cooling Towers
Foundations
Heat Pumps
Playgrounds
Windows

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Annually (A)

Air Conditioners
Asbestos Management
Auditoriums
Backflow Prevention
Boilers
Building Envelopes
Carbon Monoxide
Carpets
Chemical Maintenance
Concrete
Cooling Towers
Cross Connection Control
Doors
Drinking Water
Elevators/Escalators
Fire Extinguishers
Fire Proofing
Fire Sprinkler Systems
Gutters, Downspouts, Scuppers, Storm Drains
Hot Water (Domestic)
Humidifier System
HVAC
Indoor Athletic Facilities
Irrigation Systems
Kitchen Hoods
Lead in Drinking Water
Shut-off Valves
Stadiums, Bleachers, Grandstands
Storage Tanks – Above Ground
Water Treatment (Boilers)

As Necessary (N)

Auditoriums
Ceilings
Chemical Storage
Chemical Maintenance
Exhaust Vents
Fire Hydrants
Fire Sprinkler Systems
Floors
Furnace
Gutters, Downspouts, Scuppers and Storm Drains
HVAC
Outside Air Intakes
Stadiums, Bleachers and Grandstands
Water Efficiency

Resources

This is a compilation of citations from the body of the manual. These sites are either state or federal government locations which are public information. Any non-governmental agencies used are public as well.

1. American with Disabilities Act (ADA)

MA Office on Disabilities
http://www.mass.gov/mod/default.html

MA Architectural Access Board
http://www.mass.gov/aab/

ADA Accessibility Guidelines for Buildings and Facilities (ADAAG)
http://www.access-board.gov/adaag/html/adaag.htm

ADA Hot Links and Document Center
http://www.jan.wvu.edu/links/adalinks.htm

U.S. Department of Justice, Americans with Disabilities Act, ADA HOME PAGE
http://www.usdoj.gov/crt/ada/adahom1.htm

2. Asbestos Hazard Emergency Response Act (AHERA)

MA Department of Environmental Protection
Asbestos Information & Resource Guide
http://www.mass.gov/dep/air/asbguid.htm

The Division of Occupational Safety's (DOS's) Asbestos Program
http://www.mass.gov/dos/asbestos/index.htm

OSHA Asbestos Advisor
http://www.osha.gov/dts/osta/oshasoft/asbestos/index.html

Generic O&M Manual for Asbestos
To be added.

3. Attics

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-402.htm

4. Bloodborne Pathogens

Commonwealth of Massachusetts-Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/pdf_410_ecp_schools.pdf

U.S. Department of Labor Occupational Safety & Health Administration
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

OSHA compliance
http://www.freeoshainfo.com/pubpages/bbp.htm

5. Carbon Monoxide Monitors

MA Department of Fire Services
http://www.mass.gov/dfs/osfm/pubed/flyers/carbon_monoxide_ff.pdf

http://www.mass.gov/dfs/index.shtm

6. Ceilings

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-378.htm

7. Chemical Maintenance

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

8. Chloro-fluorocarbons (CFC) (Refrigeration)

Chlorofluorocarbons - CFC's
http://www.c-f-c.com/supportdocs/cfcs.htm

9. Clean Air Act (CAA)

MA Department of Environmental Protection
http://www.mass.gov/dep/air/

MA Office of Coastal Zone Management
http://www.mass.gov/czm/envpermitcleanair.htm

Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&sid=Eeohhs2

10. Cross Connection Control – Backflow Prevention

Mass DEP
http://www.mass.gov/dep/water/drinking/welltips.pdf

MassDEP Contacts: Water & Wetlands
http://www.mass.gov/dep/about/organization/watcon.htm#gw

11. Elevators

Department of Public Safety
http://www.mass.gov/dps/elevator.htm

12. Emergency Preparedness and Response

MA Emergency Management Agency
http://www.mass.gov/?pageID=eopsagencylanding&&L=3&sid=Eeops&L0=Home&L1=Public+Safety+Agencies&L2=Massachusetts+Emergency+Management+Agency

Department of Public Health
http://www.mass.gov/dph/topics/bioterrorism/bt.htm

MA Operational Services Division
http://www.mass.gov/Aosd/docs/otherforms/EmergencyResponseSuppliesBookletRev7_060106.doc

Homeland Security
Office of State and Local Government Coordination and Preparedness (Cut and Paste)
http://www.ojp.usdoj.gov/odp/docs/slgcpfactsheet.pdf
Exercises
http://www.ojp.usdoj.gov/odp/exercises.htm
Lessons Learned and Information Sharing
http://www.ojp.usdoj.gov/odp/llis.htm

BOMA
Addressing the Threat to Commercial Buildings of an Avian Flu Epidemic
http://www.bomatoronto.org/pdfs/BOMA_Toronto_Pandemic_Workbook_2006.pdf

13. Energy Efficiency – Sustainable Design

MA DEP – Executive Office of Environmental Affairs
http://www.mass.gov/envir/Sustainable/compliance/CSI_Accomp.htm

US General Services Administration
http://gsa.gov/Portal/gsa/ep/contentView.do?P=MPW&contentId=9837&contentType=GSA_OVERVIEW

MA Operational Services Division – Environmentally Preferable Products (EPP)
http://www.mass.gov/portal/site/massgovportal/menuitem.3b4ee5b1fa7a31c14db4a11030468a0c/?pageID=osdterminal&L=3&L0=Home&L1=Buy+from+a+Contract&L2=Green+Products&sid=Aosd&b=terminalcontent&f=osd_es_green&csid=Aosd

US Department of Energy – Free Software Tools
http://www1.eere.energy.gov/industry/bestpractices/software.html#cwsat

U.S. Department of Energy – 20 Ways to Save Energy Now
http://www.eere.energy.gov/consumer/industry/20ways.html
http://resourcecenter.pnl.gov/cocoon/morf/ResourceCenter

U.S. Green Building Council
http://www.usgbc.org

Division of Capital Asset Management-Energy Conservation
http://www.mass.gov/cam/statewide/sw-energyconserv01.html

Northeast Sustainable Energy Association
http://www.nesea.org

14. Ergonomics

Commonwealth of Massachusetts-Division of Occupational Safety
http://www.mass.gov/dos/consult/index.htm

U.S. Department of Labor ©© Occupational Safety & Health Administration
http://www.osha.gov/SLTC/ergonomics/

15. Fire Codes

MA Department of Fire Services
http://www.mass.gov/dfs/index.shtm

NFPA
http://www.nfpa.org

16. Hazard Communications Program- Employee Right to Know

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

OSHA
http://www.osha.gov/as/opa/worker/rights.html

17. Hazardous Energy Sources

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/index.htm

OSHA
http://www.osha.gov/OshDoc/data_General_Facts/factsheet-lockout-tagout.pdf

18. Hazardous Waste – Resource Conservation and Recovery Act (RCRA)

U.S. Environmental Protection Agency
http://www.epa.gov/rcraonline/

Commonwealth of Massachusetts Department of Environmental Protection
Toxics and Hazards
http://www.mass.gov/dep/toxics/
Hazardous Waste Management
http://www.mass.gov/dep/recycle/hazwaste.htm

19. Hazardous Waste Operations and Emergency Response (Hazardous Materials Release Plan)

OSHA
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765

Commonwealth of Massachusetts – Department of Public Health Emergency Preparedness & Response Advisory Committee
http://www.mass.gov/dph/bioterrorism/advisorygrps/decon_minutes_12_02.htm

20. Indoor Air Quality (IAQ)

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/index.htm

Commonwealth of Massachusetts – Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&sid=Eeohhs2

Environmental Protection Agency
http://oaspub.epa.gov/webi/meta_first_new2.try_these_first

Fundamentals of IAQ in Buildings
http://www.epa.gov/iaq/largebldgs/i-beam_html/ch1-fund.htm#Overview%20of%20Indoor%20Air%20Quality%20in%20I-BEAM

Green Guard
http://www.greenguard.org/DesktopDefault.aspx

Green Seal
http://www.greenseal.org/

Master Painters Institute
http://www.paintinfo.com/

21. Integrated Pest Management

U.S. Environmental Protection Agency
http://www.epa.gov/pesticides/ipm/

Massachusetts Department of Food and Agriculture
Schools
http://massnrc.org/ipm/

22. Lead-Based Paint

Commonwealth of Massachusetts-Health and Human Services
Massachusetts Lead Law Information
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=6&L0=Home&L1=Government&L2=Laws%2c+Regulations+and+Policies&L3=Department+of+Public+Health+Regulations+%26+Policies&L4=Regulations+and+Other+Publications+-+I+to+L&L5=Lead+-+The+Massachusetts+Lead+Law+and+Legal+Documents&sid=Eeohhs2

Commonwealth of Massachusetts Division of Occupational Safety
http://www.mass.gov/dos/lead/index.htm

EPA
http://www.epa.gov/lead/

National Lead Information Center
http://www.epa.gov/lead/pubs/nlic.htm

23. Lead in Drinking Water

Mass DEP
http://www.mass.gov/dep/water/drinking/lead01.htm

MWRA
http://www.mwra.state.ma.us/04water/html/qual6leadinfo.htm

EPA
http://www.epa.gov/safewater/lead/index.html
http://www.epa.gov/safewater/schools/pdfs/lead/qrg_lcr_schools.pdf

24. Material Safety Data Sheets (MSDS)

Commonwealth of Massachusetts – Division of Occupational Safety
http://www.mass.gov/dos/rtk/index.htm

MSDS National Repository
http://www.msdssearch.com/

25. Mercury Prevention

MA DEP
http://www.mass.gov/dep/recycle/hazardous/mercury.htm
MA Sustainability Program
http://www.mass.gov/envir/Sustainable/resources/Res_main.htm

MA Department of Public Health
http://www.mass.gov/dph/topics/mercury.htm

EPA
http://www.epa.gov/epaoswer/hazwaste/mercury/index.htm

26. Mold

Commonwealth of Massachusetts-Division of Occupational Safety
http://www.mass.gov/dos/iaq/index.htm

Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=7&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Indoor+Air+Quality&L6=Mold%2c+Moisture%2c+and+Mildew&sid=Eeohhs2

EPA
http://www.epa.gov/mold/mold_remediation.html
http://www.epa.gov/mold/moldcourse/

International Center for Toxology in Medicine
http://www.ictm.com/query.idq?CiRestriction=mold&CiSort=rank%5Bd%5D&CiMaxRecordsPerPage=10&CiScope=%2F&HTMLQueryForm=query.htm

27. National Pollutant Discharge Elimination System (NPDES) (Stormwater)

Metropolitan Area Planning Council
http://www.mass.gov/envir/smart_growth_toolkit/LID/regional_planning/LID/PDFs/Stormwater_Bylaw_Primer.pdf

MWRA
http://www.mwra.state.ma.us/harbor/html/npdes_091503.htm

EPA
http://cfpub.epa.gov/npdes/

28. Paint

Master Painters Institute

http://www.paintinfo.com/

29. Permit-Required Confined Spaces

MA Division of Occupational Safety
http://www.mass.gov/dos/iaqdocs/iaq-405.htm

OSHA
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9797&p_table=STANDARDS

30. Personal Protective Equipment (PPE)

Commonwealth of Massachusetts-Division of Occupational Safety- Respirators
http://www.mass.gov/dos/iaqdocs/iaq-395.htm

MA Dept of Public Health
http://www.mass.gov/dph/bioterrorism/advisorygrps/decon_program.htm

OSHA
http://www.osha.gov/OshDoc/data_General_Facts/ppe-factsheet.pdf
http://www.free-training.com/osha/ppe/ppemenu.htm

31. Playground Safety

US PIRG Nationwide Survey of Public Playgrounds
http://uspirg.org/reports/playground2002/FINALwithAppx.pdf
http://uspirg.org/reports/playground2002/MassachusettsSummary.pdf
US Consumer Product Safety Commission
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9797&p_table=STANDARDS

32. Radon

MA Health and Human Services
http://www.mass.gov/portal/site/massgovportal/menuitem.6b3609bb385731c14db4a11030468a0c/?pageID=eohhs2subtopic&L=7&L0=Home&L1=Consumer&L2=Community+Health+and+Safety&L3=Environmental+Health&L4=Environmental+Exposure+Topics&L5=Radiation+Control&L6=Radon&sid=Eeohhs2

EPA
http://www.epa.gov/radon/radonqa1.html

33. Recalls

US. Consumer Protection Safety Commission
http://www.cpsc.gov/cpscpub/prerel/prerel.html

34. Safe Drinking Water Act (SDWA)

MA DEP
http://mass.gov/dep/water/drinking.htm

EPA
http://www.epa.gov/safewater/sdwa/basicinformation.html

35. Steam

US Department of Energy
http://www.eere.energy.gov/catalog/Scripts/prodList.asp?idSuper=16&showprods=true&browse=prog&Type=12&idCategory=102

36. Stormwater

EPA
http://cfpub.epa.gov/npdes/home.cfm?program_id=6

37. Underground Storage Tanks (USTs), Resource Conservation and Recovery Act (RCRA)

MA Department of Fire Services
http://www.mass.gov/dfs/osfm/fireprevention/ust/index.htm

EPA
http://www.epa.gov/OUST/

38. Utilities

MA Dept. of Telecommunications and Energy
http://www.mass.gov/dte/links.htm

Associations and Additional Resources

Air Conditioning & Refrigeration Institute (ARI)
http://www.ari.org/

American Society for Healthcare Engineering of the American Hospital Association (ASHE)
http://www.ashe.org

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)
http://www.ashrae.org

American National Standards Institute
http://www.ansi.org/

Association of Higher Education Facilities Officers (APPA)
http://www.appa.org

Building Owners and Managers Association (BOMA)
http://www.boma.org/

Carpet & Rug Institute
http://www.carpet-rug.com/

Cleaning & Maintenance Management Magazine
http://www.cmmonline.com

Cleaning Management Institute (CMI)
http://www.cm-instituteonline.com/

Energy Star
http://www.energystar.gov/

Facility Zone – Search Site
http://www.facilityzone.com/

International Facility Management Association (IFMA)
http://www.ifma.org/

National Association of State Facilities Administrators (NASFA)
http://www.nasfa.net

National Fire Protection Associations (NFPA)
http://www.nfpa.org

Operational Services Division - Commonwealth of Massachusetts
http://www.mass.gov/?pageID=osdhomepage&L=1&L0=Home&sid=Aosd

School Facilities Magazine
http://www.schoolfacilities.com

Soap & Detergent Association (SDA)
http://www.sdahq.org/

This guidance document is intended to assist facilities maintenance and operations staff in performing their duties. Facilities staff are advised that this document does not constitute legal advice nor does it relieve facilities operators and maintainers of meeting their obligations and responsibilities in performing their job duties. The documents and other references cited in this document reflect information available at the time of its publication; however, it is the responsibility of facilities personnel to ensure that they meet the current and relevant technical, legal and regulatory requirements associated with operating and maintaining facilities.

US Center for Disease Control & Prevention – National Institute for Occupational Safety & Health (NIOSH)
http://www.cdc.gov/niosh/homepage.html

Associations and Additional Resources, continued

US Consumer Product Safety Commission (CPSC)
http://cpsc.gov/

US Department of Energy –Energy Efficiency and Renewable Energy (EERE)
http://www.eere.energy.gov/

US Department of Labor- Occupational & Safety Health Administration (OSHA)
http://www.osha.gov/

US Environmental Protection Agency (EPA)
http://www.epa.gov/

US Fed World – Easy Access to Government Information
http://www.fedworld.gov/

US Federal Emergency Management Agency (FEMA)
http://www.fema.gov/

US Food & Drug Administration (FDA)
http://www.fda.gov/

Other Resources Available

Renovations In Buildings While Occupied

http://www.doe.mass.edu/lawsregs/603cmr38/#03 –See section 38.03 #11 – Gen. Reqs.: Capital Const.

http://www.smacna.org/

http://www.epa.gov/iaq/molds/mold_remediation.html

http://www.epa.gov/iaq/schools

www.state.ma.us/dep/appkits/aq06.doc

HVAC Systems Maintenance

http://www.state.ma.us/bbrs/code.htm

http://www.ashrae.org

http://www.smacna.org

http://www.state.ma.us/dph/beha/iaq/iaqhome.htm

http://www.cdc.gov/niosh/baqact4.htm

Building Envelope Issues

http://finance1.doe.mass.edu/sbuilding/maint_b.html

http://www.state.ma.us/bbrs/code.htm

http://www.buildingscience.com/resources/mold/Design_Build.pdf

http://envelopes.cdi.harvard.edu/envelopes/web_pages/home/home.cfm

Chemical Management

http://www.state.ma.us/dph/beha/iaq/articles/mhoa.pdf

http://www.state.ma.us/ota/specprog.htm#schools

www.newmoa.org

http://www.ansi.org/

http://www.epa.gov/opptintr/pcb

Drinking Water (Lead and Other Issues)

http://www.state.ma.us/dph

http://www.state.ma.us/dep

Certified operator directory - http://www.state.ma.us/dep/brp/dws/files/opbytown.pdf

Cross-connections - http://state.ma.us/dep/brp/dws/crosscon.htm

Water Supply Regulations - http://state.ma.us/dep/brp/dws/regs.htm

Water Supply Guidelines - http://state.ma.us/dep/brp/dws/files/guides/guides.htm

Furnace/Boiler Maintenance

http://www.state.ma.us/dps/

http://www.state.ma.us/dos

http://www.state.ma.us/dph/dcs/sancodin.htm

Asbestos Management

http://www.state.ma.us/dos

http://www.state.ma.us/dep

http://www.epa.gov

IPM Plans

www.mass.gov/dfa

Massachusetts Department of Food and Agriculture
251 Causeway Street
Boston, MA 02114
617-626-1700

USTs

http://www.state.ma.us/dfs/ust/ustHome.htm

http://www.epa.gov

http://www.state.ma.us/dep

Septic Systems (Title V)

http://www.state.ma.us/dos

http://www.state.ma.us/dep

http://www.epa.gov

Miscellaneous Custodial/Maintenance Issues

http://www.iicrc.org

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www.epa.gov/iaq/schools/

http://www.epa.gov/opptintr/pcb